
Eckman Environmental

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ONSITE WASTEWATER PLANNING

On-Site Wastewater Design Report for Techerra Ranch

APN 193-020-38

Prepared for:

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Marin County Environmental Health Services

Civic Center, Room 236

San Rafael, CA 94903

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OVERVIEW

This letter presents the design report for a new on-site wastewater disposal system for a multi-family emergency agricultural housing at the Techerra Ranch property.

The design is for fifty (50) residents. The leach field and the reserve area can accommodate 1,890 gpd. Fieldwork was conducted by CSW including percolation testing, soils profiles and groundwater water monitoring was in 2000 for a Class I mound system.

SUPPORTING FIELDWORK

Dates:

- Groundwater Monitoring- April 17th, 24th and 27th, 2000
- Percolation Testing- April 27th and 28th, 2000 percolation testing
- Soil Profiles- April 15th, 2020

Details:

- Soil profile inspection pits
 - The soils generally consist of sandy loams underlain by loams or sandy clay to depths of 36-inches.

- 6x groundwater monitoring wells. Groundwater determination after significant rainfall events. Test holes met the 24-inch separation to groundwater. Faint mottling at an average of 27-inches.
- 13 x percolation tests conducted in 2000.
 - Conducted at depths between 12-inches and 24-inches.

Test Results:

Percolation Test Results By CSW

<i>Test #</i>	<i>Depth (inches)</i>	<i>Percolation Rate (MPI)</i>
P1	18	30
P2	24	60
P3	18	60
P4	24	40
P5	18	60
P6	18	60
P7	18	120
P8	24	40
P9	18	30
P10	18	NP
P11	24	NP
P12	24	NP
P13	18	60
<i>Average Rate</i>		56 MPI

PROPOSED SYSTEM

Septic Tanks

Three new 2,000-gallon concrete septic tanks with commercial effluent filters to collect waste from to be determined cluster of units of temporary housing. Per Code a six bedroom cluster, or 19 residents based on 25 gallons per person, can be accommodated by one 2,000-gallon tank.

New Pump Chamber and Pump System

New 5,000-gallon concrete pump chamber and a duplex alternating pump with associated controls to pump treated effluent to the mound system. This allows for one day of emergency storage due to power outage or pump failure and can serve to handle any surge flows by utilizing time metered dosing.

Mound Disposal System

Slopes in the primary and reserve mound area are less than 2-percent.

- Design flow: 150 gpd/bedrooms x 18 bedrooms (less 30% for low flow plumbing fixtures) = 1,890 gpd;
- Design flow for emergency housing: 50 people @ 25 gpd/person = 1,250 gpd
- Gravel bed loading rate for multi residential: 1.0 gpd/ft²
- Average Percolation Rate: 56 MPI
- Basal area loading rate: 1.5 (0.53gpd/ft²) = 0.8 gpd/ft²
- Required gravel bed sizing: (1,890 gpd) / (1.0 gpd/ft²) = 1,890 ft²
- Gravel bed dimensions: 10-feet by 189-feet = 1,890 ft²
- Sand fill depth: 12-inches below gravel at edge of distribution bed;
- Soil cover depth: 18-inches over center; 12 inches over 3:1 side slope;
- Provided sand basal area: 24' x 203' = 4,872 ft²;
- Required basal area for peak flows:

$$(1,890\text{gpd})/(0.80 \text{ gpd/ft}^2) = 2,362.5 \text{ ft}^2 \text{ required}$$

Safety factor:

$$(4,872 \text{ ft}^2)/(2,362/5 \text{ ft}^2) = 2 \text{ times.}$$

Loading rate per **Table M-2** (0-2% slope, 56 **MPI**): N/A based on basal area

Hydraulic Calculations Summary

- Distribution laterals: 1 1/4-inch;
- Zone A: 3 laterals @ 60-feet and 2 laterals @ 45-feet.
- Zone B: 3 laterals @ 60-feet and 2 laterals @ 45-feet.
- Discharge holes: 3/16-inch diameter, 4.5' O.C., 65 holes per Zone;
- Discharge per hole: 0.72 gpm @ 3' pressure head;
- Total system discharge rate per Zone: (65 holes) (0.72gpm/hole) = 50 gpm

Effluent Submersible Pump: Orenco Model # PEF100 (1 HP) to deliver 50 gpm @ 40' TDH;

Minimum Dose Volume: gallons (5 to 10 times the volume of distribution laterals).

ADDITIONAL DOCUMENTS

Three sets of construction plans, pump curve, field data.

If you have any additional questions, please email me at info@eckmanenvironmental.com.

Sincerely,



Noadiah S. Eckman, P.G.
Managing Geologist

Figure 1
130 Mesa Road, Proposed Septic Study Area
With USACE and CCC Wetlands

Legend

- 50' Setback
- California Coastal Commission Wetland
- Farm Access Road
- Livestock Yard
- USACE Wetland
- Wastewater Leachfield
- Wetland Determination Data Point

